AB PROJECTS
Engineering and Management

water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

MAFUBE LOCAL MUNICIPALITY

WATER METER REPLACEMENT PROGRAM

WATER METER AUDIT REPORT – DRAFT VERSION 1

26 JUNE 2020

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1. DOCUMENT CONTROL

1.1 RECORD OF AMENDMENTS

Revision	Date Issued	Reason Issued
v1.0	24 JUNE 2020	Approval by MLM

1.2 CONTROL STATEMENT

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1.3 REGISTERED HOLDERS

Name	Organisation	Role	Revision
Suveer Maharaj	AB Projects	Project Manager	v1.0

1.4 DOCUMENT APPROVAL

	Name	Organisation	Date	Signature
Prepared by	Suveer Maharaj	Project Manager	24 JUNE 2020	Maharaj
Checked by	Pradeep Ramlall	Project Director	24 JUNE 2020	PRamlall
Supported by	Diao Ramabitsa	Mafube LM – Infrastructure Director		
Approved by	Kadimo Masekoane	Mafube LM – Municipal Manager		
Accepted by	Mr Moses Moremi	Administrator – Mafube LM		

2. INTRODUCTION & BACKGROUND

The Mafube Local Municipality has been plagued with high levels of Non-Revenue Water. A Water Conservation Water Demand management strategy had been completed by MISA in April 2019. The municipality incurred water losses of 2 131 million kilolitres amounting to R4.691 million rand for the 2017/2018 financial year. The Water Conservation Water Demand Management Strategy is to be used as a strategic guideline framework which shows that non-revenue water currently sits at 48.5%. This is high and requires urgent intervention as detailed further within this Implementation Plan.

The AGSA report highlighted that Non-Revenue Water in the Municipality is a major problem and must be reduced in order to save water, improve revenue collection as well as save the municipality money in terms of its core function as WSA. A water meter replacement strategy was developed and this plan aims to identify and implement strategies to reduce Non-Revenue Water, extend the remaining useful life span of infrastructure, reduce water losses and create a revenue stream at the Municipality, making it sustainable.

In cases where there are meters installed, the meters are old, inaccurate and unreliable. The billing database for the Municipality has been analysed and the top consumers have been identified. New meters will be installed in towns specifically targeting industries, businesses/commercial and domestic residents.

This Plan aims to address the increase in revenue by installing New Water Meters which has in many instances been shown to be self-funding and self-regulating in terms of affordability and level of service that is desired. It is envisaged that revenue collection will be improved and funding could be used for reducing water losses. The full benefit of the system is important in that water resources and infrastructure could be extended to supply water to unserved population and defer the onset of a Capital-Intensive Infrastructure Programme by simply fixing the leaks and improving revenue collection.

3. WATER METER AUDIT OF MAFUBE LM

3.1 WATER METER AUDIT

An Audit of all Water Meters located at the Municipality has commenced in all four towns and findings can be seen;

Meter Verification and Assessment began on the 13th May 2020 and focus was made on the Residential, Commercial and Industrial Areas. Table below shows a summary of meters verified to date ending 12th June 2020;

Towns	Visited Meters
Frankfort	
Residential	893
Industrial	34
Commercial	108
Total	**1035**
Tweeling	
Residential	232
Commercial	19

Total	**251**
Cornelia	
Residential	135
Commercial	6
Total	**141**
Villiers	
Residential	401
Industrial	9
Commercial	26
Total	**436**
TOTALS TOWNS	**1863**
Townships	**Visited Meters**
Villiers Qalabotjha	3380
Tweeling Mafahlaneng	0
Cornelia Ntswanatsatsi	0
Frankfort Namahadi	0
TOTALS TOWNSHIPS	**3380**

Town	Category	Visited Meters	Total
Frankfort	- Institutional Buildings	6	**893**
	- Educational Buildings	2	
	- Government Buildings	2	
	- Industrial Buildings	34	
	- Commercial Buildings	108	
	- Residential Buildings	741	
Tweeling	- Institutional Buildings	4	**248**
	- Educational Buildings	2	
	- Government Buildings	2	
	- Industrial Buildings	1	
	- Commercial Buildings	17	
	- Residential Buildings	222	
Cornelia	- Institutional Buildings	5	**141**
	- Educational Buildings	2	
	- Government Buildings	1	
	- Industrial Buildings	1	
	- Commercial Buildings	10	
	- Residential Buildings	122	
Villiers	- Institutional Buildings	5	**427**
	- Educational Buildings	1	
	- Government Buildings	3	
	- Industrial Buildings	9	
	- Commercial Buildings	26	
	- Residential Buildings	383	

3.2 STATISTICAL ANALYSIS

Frankfort

- To date **893** Meters have been visited on site in Frankfort within its Residential, Commercial and Industrial Areas.
- **712** out of **893** Meters have been located and assessed on site. Out of the **712** meters successfully located on site the following were found;
    - **236** out of **712** Meters were successfully verified and assessed with no issues.
    - Meter readings/meter numbers could not be visible on **424** out of **712** verified meters
    - **52** out of **712** Meters were either Buried or Flooded.
    - **22** out of **712** Meters were found to be not working/turning.
- **45** out of **893** Meters were not present on site (Unmetered).
- **136** out of **893** Meters were inaccessible.

Tweeling

- To date **251** Meters have been visited on site in Tweeling within its Residential, Commercial and Industrial Areas.
- **156** out of **251** Meters have been located and assessed on site. Out of the **156** meters successfully located on site the following were found;
    - **143** out of **156** Meters were successfully verified and assessed with no issues.
    - Meter readings/meter numbers could not be visible on **424** out of **156** verified meters
    - **6** out of **156** Meters were either Buried or Flooded.
    - **5** out of **156** Meters were found to be not working/turning.
- **42** out of **251** Meters were not present on site (Unmetered).
- **53** out of **251** Meters were inaccessible.

Cornelia

- To date **141** Meters have been visited on site in Cornelia within its Residential and Commercial Areas.
- **109** out of **141** Meters have been located and assessed on site. Out of the **101** meters successfully located on site the following were found;
    - **43** out of **101** Meters were successfully verified and assessed with no issues.
    - Meter readings/meter numbers could not be visible on **56** out of **101** verified meters

  - **10** out of **101** Meters were either Buried or Flooded.
  - **7** out of **101** Meters were found to be not working/turning.
- **3** out of **141** Meters were not present on site (Unmetered).
- **29** out of **141** Meters were inaccessible.

Villiers

- To date **436** Meters have been visited on site in Villiers within its Residential and Commercial Areas.
- **396** out of **436** Meters have been located and assessed on site. Out of the **396** meters successfully located on site the following were found;
  - **300** out of **436** Meters were successfully verified and assessed with no issues.
  - Meter readings/meter numbers could not be visible on **72** out of **300** verified meters
  - **24** out of **300** Meters were either Buried or Flooded.
  - **10** out of **300** Meters were found to be not working/turning.
- **20** out of **436** Meters were not present on site (Unmetered).
- **20** out of **436** Meters were inaccessible.

Villiers - Qalabotjha

- To date **3380** Meters have been visited on site in Qalabotjha which consists of Rural Township Areas.
- **3305** out of **3380** Meters have been located and assessed on site. Out of the **3305** meters successfully located on site the following were found;
  - **2672** out of **3380** Meters were successfully verified and assessed with no issues.
  - Meter readings/meter numbers could not be visible on **168** out of **3380** verified meters
  - **465** out of **3380** Meters were either Buried or Flooded.
  - **26** out of **3380** Meters were found to be not working/turning.
- **48** out of **3380** Meters were not present on site (Unmetered).
- **27** out of **3380** Meters were inaccessible.

Tweeling - Mafahlaneng

- To date **1278** Meters have been visited on site in Mafahlaneng which consists of Rural Township Areas.
- **1148** out of **1278** Meters have been located and assessed on site. Out of the **1278** meters successfully located on site the following were found;

  - **902** out of **1148** Meters were successfully verified and assessed with no issues.
  - Meter readings/meter numbers could not be visible on **20** out of **1148** verified meters
  - **226** out of **1148** Meters were either Buried or Flooded.
  - **0** out of **1148** Meters were found to be not working/turning.
- **88** out of **1278** Meters were not present on site (Unmetered).
- **42** out of **1278** Meters were inaccessible.

3.3 CHALLENGES AND FINDINGS

- Meters were inaccessible due to them being locked in the owner's property and were nobody was present in the household for the verification team to gain access to the meter.
- Meters were buried with debris, rock, sand or covered with thick grass.
- It was also found that meters were leaking extensively which caused the meter chambers to flood
- Meter numbers and readings became difficult to read due to the meter being aged, meter readings were misty, meters numbers were either scratched out or covered with stubborn debris.
- Properties which includes Industrial, Commercial and Residential were found to be unmetered which shows loss of revenue to the municipality.
- Households with outbuildings/cottages had more than one-meter present on the property.
- Wilge Estate in Frankfort Town showed no sign of them being billed due to lack of a water meter.
- It was found that a few meters indicated a possibility of a bypass. Further investigation to be done on these meters to verify this.
- No issues or difficulties were faced thus far whilst working in Townships.
- Newly Developed Townships at Cornelia and Tweeling are unmetered and therefore were not verifiable.

3.4 GENERAL FEEL FROM RESIDENTS ON THE GROUND

- People have generally been enthusiastic about getting prepaid water meters
- They state that their meters are old and aged and inaccurate and consumers lose trust
- Some consumers say that they haven't been paying for services and they may have exorbitant bills.

3.5 WORK SCHEDULE

Week	Town	Planned Dates
Week 1	Frankfort	13 – 15 May 2020
Week 2	None	18 – 22 May 2020

Week 3	Frankfort	26 – 28 May 2020
	Tweeling	28 – 29 May 2020
Week 4	Cornelia	01 June 2020
	Villiers	02 – 03 June 2020
	Villiers - Qalabotjha	04 June 2020
Week 5	Villiers - Qalabotjha	08 – 12 June 2020
	Tweeling - Mafahlaneng	11 – 12 June 2020
Week 6	N/A	15 June 2020
	Public Holiday	16 June 2020
	Tweeling - Mafahlaneng	17 – 19 June 2020
Week 7	Tweeling - Mafahlaneng	22 – 23 June 2020
	Cornelia - Ntwanasatsi	24 June – 25 June 2020
	Frankfort - Namahadi	25 June – 26 June 2020
Week 8	Frankfort - Namahadi	29 June – 03 July 2020
Week 9	Frankfort - Namahadi	06 July – 10 July 2020

4. PROJECT APPROACH

4.1 A PROJECT WITH A “QUICK WINS” APPROACH

The intention of this proposal is to emphasize the importance of having a prepaid water project which can ensure the following if done correctly;

- Community Acceptance
- Accredited quality-controlled installations
- Concise project management
- Project progress reports
- Product performance monitoring (Data collection/Prepaid sales statistics)
- Skills Transfer and possible EPWP
- Project handover and assurance for sustainability.

4.2 PRIORITIZING AREAS

- The potential customers identified should be added to the revenue system in an order of priority:
    - **Priority A:** Add Institutional, Commercial & Industrial Consumers (ICI). As the largest water and electricity users, ICI’s should be incorporated into the revenue system as quickly as possible.
    - **Priority B:** Add Formal Domestic Consumers. Water meters must be installed where necessary.
    - **Priority C:** Add Indigent Consumers using more than the free basic water allowance. Water meters must be installed where necessary.
    - **Priority Y:** Add Indigent Consumers using less than the free basic water allowance. Water meters need not be installed.

4.3 ANALYSE EXISTING PROPERTY USAGE AND ZONING

- Ensure ICI's are correctly zoned (and a Usage Type assigned) in order that the correct fixed charges are applied.
- Ensure remaining (domestic) property usages are correctly zoned and correct Usage Types are assigned.

4.4 BUSINESS PROCESSES

- Importantly, the municipal business processes whereby customers are added to the revenue system would need to be updated to ensure:
    - The accurate generation of the "property key" identifier against the new revenue system record; and
    - The creation or identification of a feature in the GIS with the corresponding identifier.

4.5 AREAS TO TARGET

The areas identified for meter replacement are the four towns and adhere to point 6.2 above regarding the prioritizing of consumers to maximise revenue.

In summary the areas are prioritized;

Annexure A below shows the aerial imagery for towns.

Area/Town	**Zone**	**Meters**	**Totals**
Frankfort	Residential	740	**882**
	Commercial	108	
	Industrial	34	
Villiers	Residential	350	**401**
	Commercial	42	
	Industrial	9	
Tweeling	Residential	75	**94**
	Commercial	19	
Cornelia	Residential	75	**81**
	Commercial	6	
			1458

4.5 JOB CREATION AND SUSTAINABILITY

A significant benefit of the project is the creation of employment opportunities for semi-skilled and unskilled labour within the beneficiary community. Training will be in basic plumbing skills to provide semi-skilled employment opportunities to currently unskilled labourers.

5. PRODUCT AND SOFTWARE

5.1 METER MANAGEMENT SYSTEMS SPECIFICATIONS

The meter management system can be fully integrated with any Municipal billing system and is a web-based platform accommodating mobile/PC/PDA and tablet technology. The system is diverse enough to cater for and handle ***all installation, maintenance and replacements*** of assets and are captured and loaded onto the system electronically via a mobile handheld device from the field technician. The system also caters for stores and inventory management by means of electronic stock management.

Key features/capabilities:

- Web-based system with unique URL access
- Requires only internet browser and reliable internet connection
- System updates are done remotely and automatically as it is a web-based system
- Able to handle more than 100 000 meters on separate accounts
- Profile managed via unique username and password
- Profiles are manageable to restrict or permit different levels of access
- The system can work in conjunction with a mobile application for data capturing from the field
- The system can allow for the administrator to create single or multiple job cards which includes details of work or
- actions to be taken
- The system can support a notification system alerting field technicians to respond to a required Job
- The mobile application includes the following required data for each action carried out by a field technician:

6. INSTALLATION OF PREPAID WATER METERS

The time allocated to the installation process will be dependent on the size of the area, the number of meters to be installed and the conditions of the extraction or removal of existing water meters.

To ensure that this project benefits the local community, artisans will be identified from within the community and the required skills will be provided to successfully install and maintain the prepaid water meters.

The Meterman Works Order Software ensures electronic record keeping of all job cards. The Works Order Module allows Maintenance Managers to instruct, monitor and receive information directly from technical personnel for validation of meter replacements and ensuring the updating of the financial system on new meters installed. Instructions are loaded onto a hand-held device and allows monitoring of meters as they are installed. Timeous replacement of meter numbers on the financial system leads to accurate readings, increase of revenue and ensures that consumers are able to purchase prepaid water within hours of the prepaid water meters being installed at the property.

Record keeping of old and new meters including the installation processes are kept by way of images (photos), GPS coordinates and time and date stamp software.

The Works Order Software ensures the following information is available:

- ► Unique Job Card Number
- ► Current Meter Number / New Meter number
- ► Work Descriptions
- ► Meter type
- ► Account no
- ► Consumer name and address
- ► View / Edit / Add instructions
- ► GPS Coordinates
- ► Time & date stamp
- ► Images (Old meter / New Meter/ Install Process)

6.1 SPECIFICATIONS FOR SMART WATER METERING SYSTEM

The Water Management Devices when coupled to AMANZI SA pulse output water meter by means of an electronic probe/sensor cable does have a certification of conformance in terms of the following specifications:

SANS 1529-9:2008 published by the National Regulator for Compulsory Specifications in terms of the Trade Metrology Act (No 77 of 1973)

The STS Association confirming compliance with IEC 62055-41 IEC 62055-51 and Eskom Reference Q 32DDTEDS/334

Independent Communications Authority of South Africa (ICASA) regulations published in terms of the Telecommunications Act 104 of 1996

► FLOW LIMITATION

Limitation can be achieved without restricting Flow Rate and allows full-bore flow (full pressure service) with a pressure range of 0.2bar to 16bar.

Limitation can be configurable based on volume only, on duration only and a combination of volume and duration.

Limitation can be configurable on a Daily basis with the ability to provide two allocations per day of differing volume, duration or volume and duration configuration. Multiple daily limitations are to be supported.

Limitation can also be configurable on a monthly basis.

Daily limitation from 10 liters per allocation to 100 000 liters per day

► LCD DISPLAY

- Remaining allocation in liters.
- The total dispensed to date in m3 to a minimum resolution of 0.5 liter

- The total dispensed to date can clearly differentiate between the multiples and sub multiples of m3
- Top up / Prepaid credit is to be indicated
- Visible indication of the battery status.
- Visible indication of the valve status
- Visible warning of a potential consumer side leak
- Visible Display of the product serial number on demand

TOP UP/PREPAID

- Has the ability for credit addition to the Water Management device based on the STS standard.
- The device supports an optional remote display (UIU) which may be made available to the consumer to place inside their home.
- The system supports credit transfer in volume as defined by International spec IEC 62055 – 41 & 51.
- The system supports third party vending of token and is not support a proprietary vending system.

USER INTERFACE

The User Interface Unit when linked to a Water Management Device has the following features:

- IS capable of radio communication on demand with an existing Water Management Devices installed by the utility through the ISM band (434MHz)
- Has an easy to read LCD display
- Has keypad entry for menu selection
- Has an easy to use and robust 12-digit keypad.
- Has ICASA approval
- Incorporates capacitive touch type technology to ensure robustness and longevity.
- Incorporates the numerals 0 through to 9, a backspace key and enter or # key.
- Provides audible feedback.
- Has a product life greater than 7 years.
- Has replaceable battery for in-field replacement.
- The UIU supports the following displays:

AUTOMATED METER READING CAPABILITIES

- Supports Automatic Meter Reading (AMR) via Radio in the 434 MHz ISM band.
- Supports walk by, drive by and fixed network Automatic Meter Reading (AMR)
- Provides a typical line of sight RF transmission range of more than 950m when installed more than 50 cm above ground on fixed network.
- Provides 100m to 150m line of sight RF transmission on mobile data collection.
- Supports selective parameter updates automatically whilst remotely reading the meters via RF transmission. Both in Mobile and Fixed network implementations.
- Provides the tamper and valve status in the standard meter reading radio signal
- Supports USB, and GSM download of meter readings.
- Supports a minimum of 2000 readings collected per collector before a download is required.

► SECURITY FEATURES

- Automatic valve closure/shut if the sensor cable is cut, removed or magnetically tampered with.
- Serialized and unique security seals which prevent the uncoupling of the sensor cable from the meter pulse output.
- When inspecting the valve there must not be any visible fasteners that form an integral part in the construction / integrity of the valve, the fasteners must be located behind a cover.
- Constructed from materials which have a very limited or no scrap value. Glass reinforced nylon.

7. STS VENDING SYSTEM

Utilipay is a numeric token-based vending system available as an online/web-based solution that can accommodate consumers paying accounts online, buying credit or buying prepaid electricity and water. This application is accessible from either a personal computer, smart mobile device or tablet. Non-banked consumers can purchase credit from selected outlets where point of sale terminals will be placed.

7.1 KEY FEATURES/CAPABILITIES

- Consumers are able to log in and create a unique profile
- The consumer is able to link accounts and prepaid meters to their unique profile
- Payments and purchases via credit or cheque cards linked to an account
- Payments and purchases are compatible with various e-Wallet platforms and many other local available payment portals and methods.
- Consumers can view balances and payment history on linked accounts
- System is easy-to-use and allows consumers to maintain their profiles with ease
- Prepaid token codes are sent to consumer phone or email or printed slip at terminals
- System is able to allow for administrative financial reporting on per consumer purchase history and is able to distinguish between account payments, electricity purchases and water purchases.
- The System is able to distinguish between and illustrate water values in “kL” and electricity values in “kWh”
- The system is also compatible with various financial systems
- Unstructured Supplementary Service Data (USSD) will be incorporated in the vending platform with future development should it become a client requirement.

7.2 TARIFF MANAGEMENT

A tariff generally defines at what date, to which customers, etc. a cost rate should be applied. This allows you to determine what rate and when this rate should apply. Through this set of rules, you can regulate the individual charge in your infrastructure with regards to individuals or business. Utilipay allows for Municipalities to design tariffs to suit their requirements with multiple tariffs, sub tariff structures and unlimited step intervals, as well as two free units on a single tariff.

Date activated, Municipalities can enter multi-seasonal or multi-year tariffs and the system will activate or deactivate according to the date settings

7.3 COST AND ARREAS RECOVERY

Utilipay allows for effective cost recovery as well as the collection of arrears according to a unique formula applied at the consumer level as specified at the time:

- Recovery of fixed Basic Repayment amount per month. This ensures that the consumer first settle the basic charge before having the ability to purchase water/electricity token.
- Recovery of a percentage "%" of total purchases towards arrears up to zero point. This ensures that should an 80/20 recovery be activated for every R100, R80 will be allocated for the purchase of water/electricity and the remaining R20 will be allocated to the Arrears of the consumer.
- Recovery of interest on outstanding amount.

The interface with the billing system provides for the posting of arrears collected to the relevant account.

7.4 FREE ISSUE TOKENS

Utilipay supports the issuing of free basic tokens (EBSST) to indigents. When the first transaction of the month for an indigent Consumer is committed, an additional Free Basic token is generated and printed on the slip.

7.5 BENEFITS OF SEELLING INDIRECTLY VIA VENDORS AND RETAILERS

- More convenient for consumers as they don't need to only purchase tokens at Municipality offices during office hours.
- Creates less human traffic in the Municipality Offices.
- Local Vendors and Resellers can make a little bit of money on commission but more importantly it ensures more feet through their doors and helps grow the local business and community.
- The sales of prepaid tokens can continue even if there are unforeseen operational constraints at local Municipality offices.
- Vendor Limits can be set to minimize the risk to the Municipality.

7.6 LOAD BEARING CAPACITY

Load-bearing capacity contains system database design capacity, database-supporting data capacity, online subscriber- allowed visit capacity, and equivalent hardware equipment capacity.

The system has a multi-users application which allows for multi-users to simultaneously practice a variety of on-line operations i.e. Purchase Tokens, Enquire on History, Registration, etc. The system user serial number fully meets demand which allows the operators with different names or accounts numbers to register. Furthermore, Utilipay does not have a limit on online user quantity. The system adopts multi-Web servers in parallel, and allows for adding equipment according to requirements, thus meets the demand that multi-users can simultaneously log into the system.

UMS has considered the demand for volume data and online multi-users at the beginning of system design. Therefore, the hardware equipment which we implemented as standard based on application requirements for a sizeable enterprise. This also meets the demand of equipment extensions and upgrading capabilities in future

7.7 TRANSACTION CAPACITY

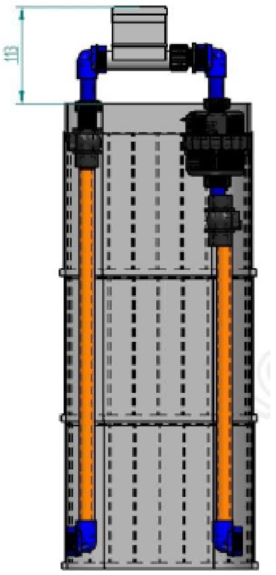
The system supports different types of transactions created via the security module and has access to high-speed security modules. The system has capability of 80 transactions per second which is 4800 transactions per minute, if there is less arithmetic. The system can create variety of transaction tokens including recharge, encryption key modification, tamper reset, clear credit reset, load threshold modification, free credit, etc. The system allows for a monitoring process status of security module and balance amount to ensure safe and stable running of the Utilipay system.

8. PRODUCT IMAGES

Water Management Device

User Interface Unit

Standard Above Ground Prepaid Assembly



Meter box height	821mm
Meter box width	120mm
Locking device	Lid fitted with locking devices, one on each side
Base plate	Fitted
Segments	The top white segment can be assembled with locking devices to enable its removal; this will make working in the inside pipe easier when the box is installed
Inlet/outlet connections	¾" female thread (other options possible)

9. PUBLIC OUTREACH

9.1 AWARENESS CAMPAIGNS

Prior to commencement of the meter replacement program, public outreach is planned for each area as they are scheduled for meter installations.

Formal communication will be sent to residents within Municipality inviting them to attend a community meeting on set dates. Pamphlets will be hand delivered to each property. Posters will also be strategically positioned at places of business in the area, at the municipality building and on public noticeboards.

A detailed outreach plan that would include, at a minimum:

- Information in newsletters.
- A “knock on every door” to provide notification of service disruption.
- Water meter brochures explaining the reason for the water meter, the Municipalities proposed plan for metering and a “most frequently asked questions” on metering.
- Water conservation information including an offer to perform a water audit.
- Information about billing, how it is calculated, when meter billing will go into effect and contact number for more information.
- Contact personnel for questions.

10. FINANCIAL DETAILS

10.1 COST ESTIMATES

The cost estimates for the recommended works can be seen in the table below for **SMART Meters;**

Item No	Description	Qty	Rate	Amount
1	**Metering**			
1.1	Complete Above Ground Prepaid Assembly with User Interface Unit - Domestic	1240	R 3 525,00	R 4 371 000,00
1.2	Complete Above Ground Prepaid Assembly with User Interface Unit - Commercial	175	R 22 985,00	R 4 022 375,00
1.3	Complete Above Ground Prepaid Assembly with User Interface Unit - Industrial	43	R 46 500,00	R 1 999 500,00
1.4	Activation of MeterMan Works Order System	1	R 110 468,73	R 110 468,73
1.5	Works Order Handheld Devices	4	R 15 000,00	R 60 000,00
1.6	Full System Training to unlimited trainees (includes theory and practical with certificate upon passing)	1	R 95 000,00	R 95 000,00
1.7	Comprehensive Community Awareness Campaign	4	R 55 000,00	R 220 000,00
1.8	Prepaid Vending System Set-Up and Implementation	1	R 425 000,00	R 425 000,00
1.9	Vending Integration with Municipal Finance System	1	R 225 000,00	R 225 000,00
1.10	Point of Sale Devices for Remote Vending	4	R 15 000,00	R 60 000,00
1.11	Field Service Terminal Kit (Used for field diagnostics, configuration and monitoring)	2	R 32 500,00	R 65 000,00
2	**Groundwater Study**			
2	Geohydrological Study	1	R -	R -
2,1	**SUB-TOTAL - PROJECT COSTS**			**R 11 653 343,73**
3	**Engineering and Project Management**			
3,1	Professional Fees	11,5%		R 1 340 134,53
3,2	Disbursement Fees - Based on Actual Invoices for accommodation, travel, printing etc	1		R 50 000,00
	SUB-TOTAL - ENG & PROJECT MANAGEMENT			**R 1 390 134,53**
	SUB-TOTAL (PROJECT+ENG & PROJECT MANAGEMENT COSTS)			R 13 043 478,26
	VAT @ 15%			R 1 956 521,74
	TOTAL INCLUDING VAT			**R 15 000 000,00**

10.2 FUNDING SOURCE

Funds to be allocated is Conditional Grant Funding from the Department of Water and Sanitation, WSIG Programme for an approved business plan.

10.3 VENDING RATES TO BE COLLECTED

UMS will collect 8% of all revenue collected on a monthly basis.

10.4 CASH FLOW

Month	Cash Flow	Accumulated Cash Flow
Jun-20	R 4 000 000,00	R 4 000 000,00
Jul-20	R 2 250 000,00	R 6 250 000,00
Aug-20	R 2 250 000,00	R 8 500 000,00
Sep-20	R 2 000 000,00	R 10 500 000,00
Oct-20	R 1 700 000,00	R 12 200 000,00
Nov-20	R 1 550 000,00	R 13 750 000,00
Dec-20	R 1 250 000,00	**R 15 000 000,00**

10.5 COST BENEFIT ANALYSIS

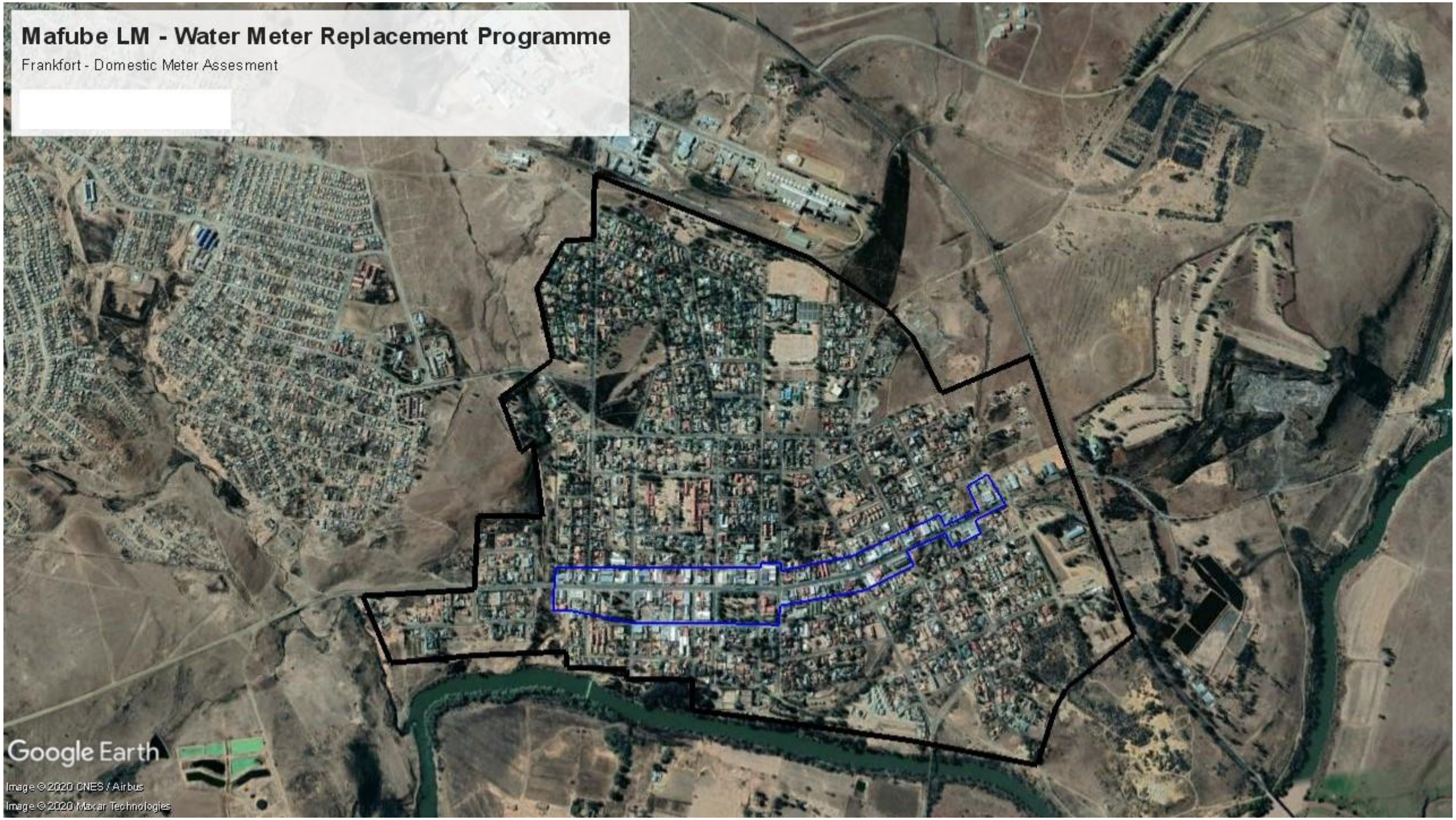
ITEM	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	AFTER 5 YEARS
FUNDING TO BE ACCESSED NOW IN YEAR 1						
WSIG Grant Funding	R 15 000 000,00					
Water Meters - Domestic	1240					
Water Meters - Industries	175					
Water Meters - Commercial	43					
Total cost	R 15 000 000,00					
REVENUE COLLECTED						
ITEM	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**AFTER 5 YEARS**
Average Monthly Revenue						
Domestic	R 125,00	R 137,50	R 151,25	R 166,38	R 183,01	R 201,31
Industrial	R 650,00	R 715,00	R 786,50	R 865,15	R 951,67	R 1 046,83
Business	R 350,00	R 385,00	R 423,50	R 465,85	R 512,44	R 563,68
No of Meters						
Domestic	1240	1240	1240	1240	1240	1240
Industrial	175	175	175	175	175	175
Business	43	43	43	43	43	43
No of Months	12	12	12	12	12	12
Total Revenue/Annum						
Domestic	R 1 860 000,00	R 2 046 000,00	R 2 250 600,00	R 2 475 660,00	R 2 723 226,00	R 2 995 548,60
Industrial	R 1 365 000,00	R 1 501 500,00	R 1 651 650,00	R 1 816 815,00	R 1 998 496,50	R 2 198 346,15
Business	R 180 600,00	R 198 660,00	R 218 526,00	R 240 378,60	R 264 416,46	R 290 858,11
	R 3 405 600,00	**R 3 746 160,00**	**R 4 120 776,00**	**R 4 532 853,60**	**R 4 986 138,96**	**R 5 484 752,86**
Revenue Split - Municipality 30%	R 1 021 680,00	R 1 123 848,00	R 1 236 232,80	R 1 359 856,08	R 1 495 841,69	R 1 645 425,86
Revenue Split - Reinvestment 70%	R 2 383 920,00	R 2 622 312,00	R 2 884 543,20	R 3 172 997,52	R 3 490 297,27	R 3 839 327,00
Cash Available	R 2 383 920,00	R 5 006 232,00	R 7 890 775,20	R 11 063 772,72	R 14 554 069,99	R 18 393 396,99

11. PROGRAMME OF WORKS

NO.	DESCRIPTION	MAY 2020				JUNE 2020				JULY 2020				AUGUST 2020				SEPTEMBER 2020				OCTOBER 2020				NOVEMBER 2020			
		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W29	W30	W31	W32	W33	W34	W35	W36
1,0	Meter Audit & Verification	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨																				
2,0	Billing Database Audit								🟨	🟨	🟨																		
3,0	Supply and Installation of Prepaid Water Meters - Domestic						🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨														
4,0	Supply and Installation of Prepaid Water Meters - Commercial											🟨	🟨	🟨	🟨	🟨	🟨												
5,0	Supply and Installation of Prepaid Water Meters - Industrial													🟨	🟨	🟨	🟨	🟨	🟨										
6,0	Vending System Installation and Commissioning																	🟨	🟨	🟨	🟨								
7,0	Vending Integration with Municipal Finance									🟨	🟨	🟨	🟨																
8,0	GIS Database for consumers incl property key																					🟨	🟨						

12. ANNEXURE A

12.1 FRANKFORT

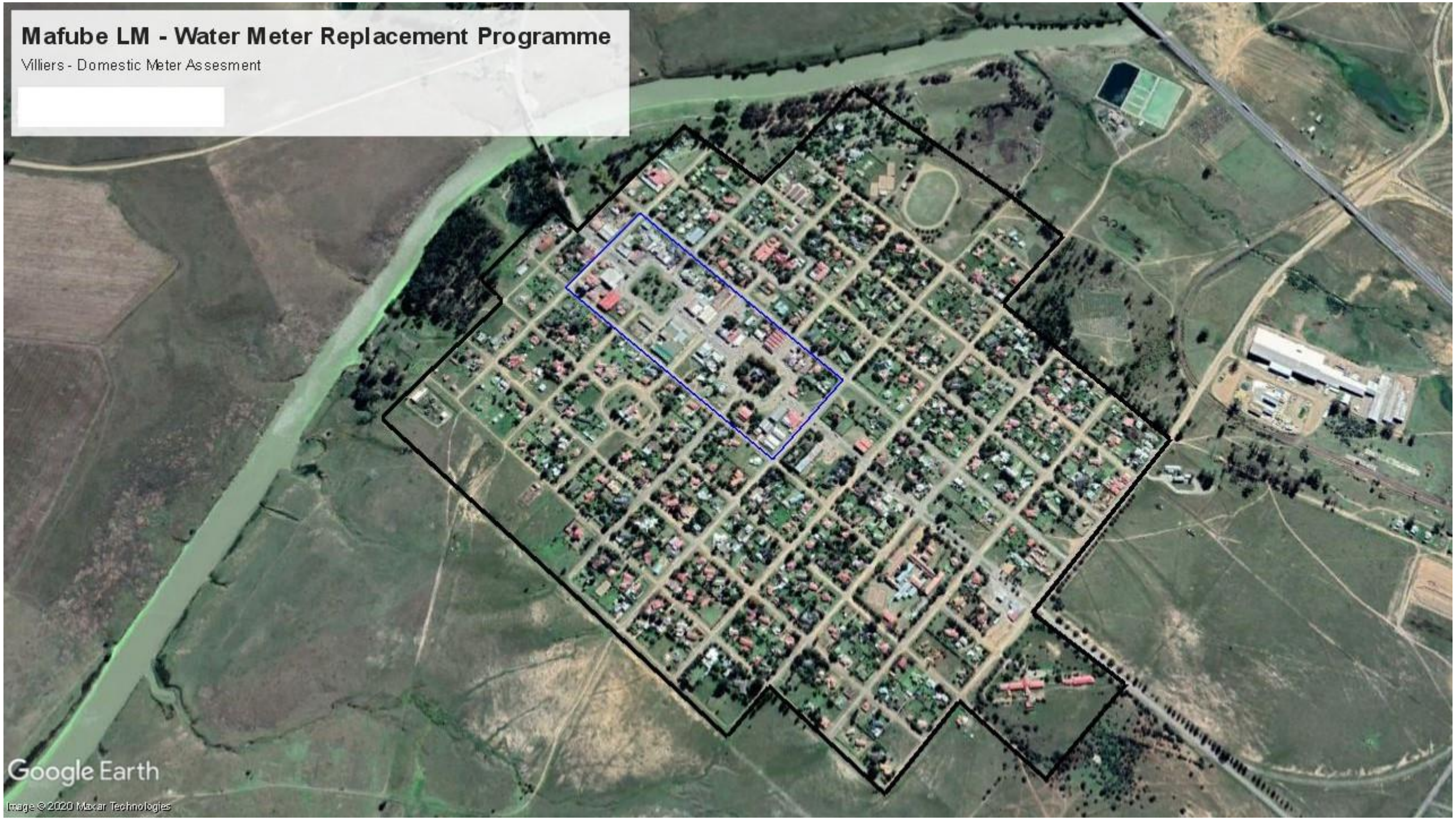


Mafube LM - Water Meter Replacement Programme

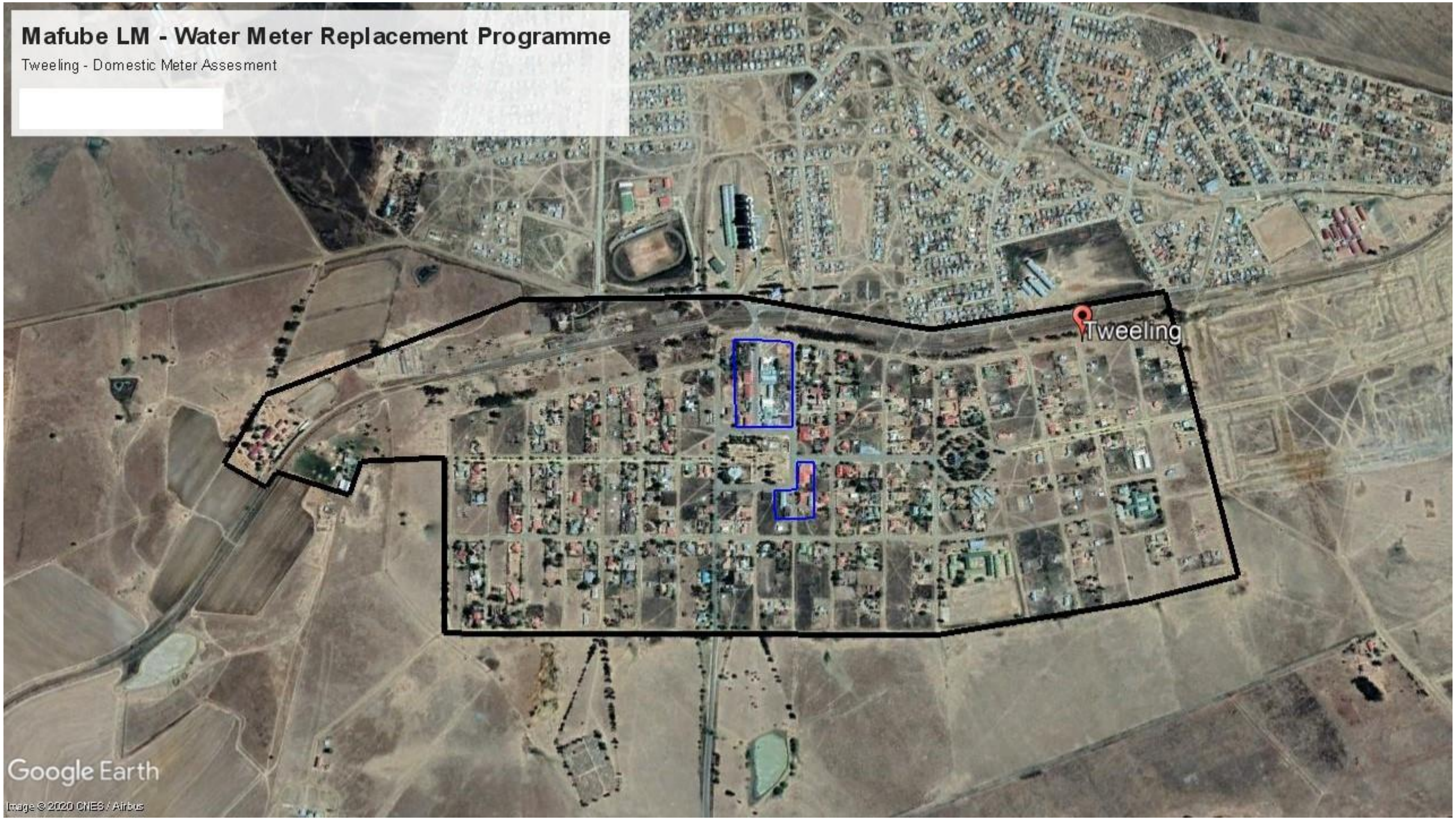
Frankfort - Domestic Meter Assesment

Image © 2020 CNES / Airbus
Image © 2020 Maxar Technologies

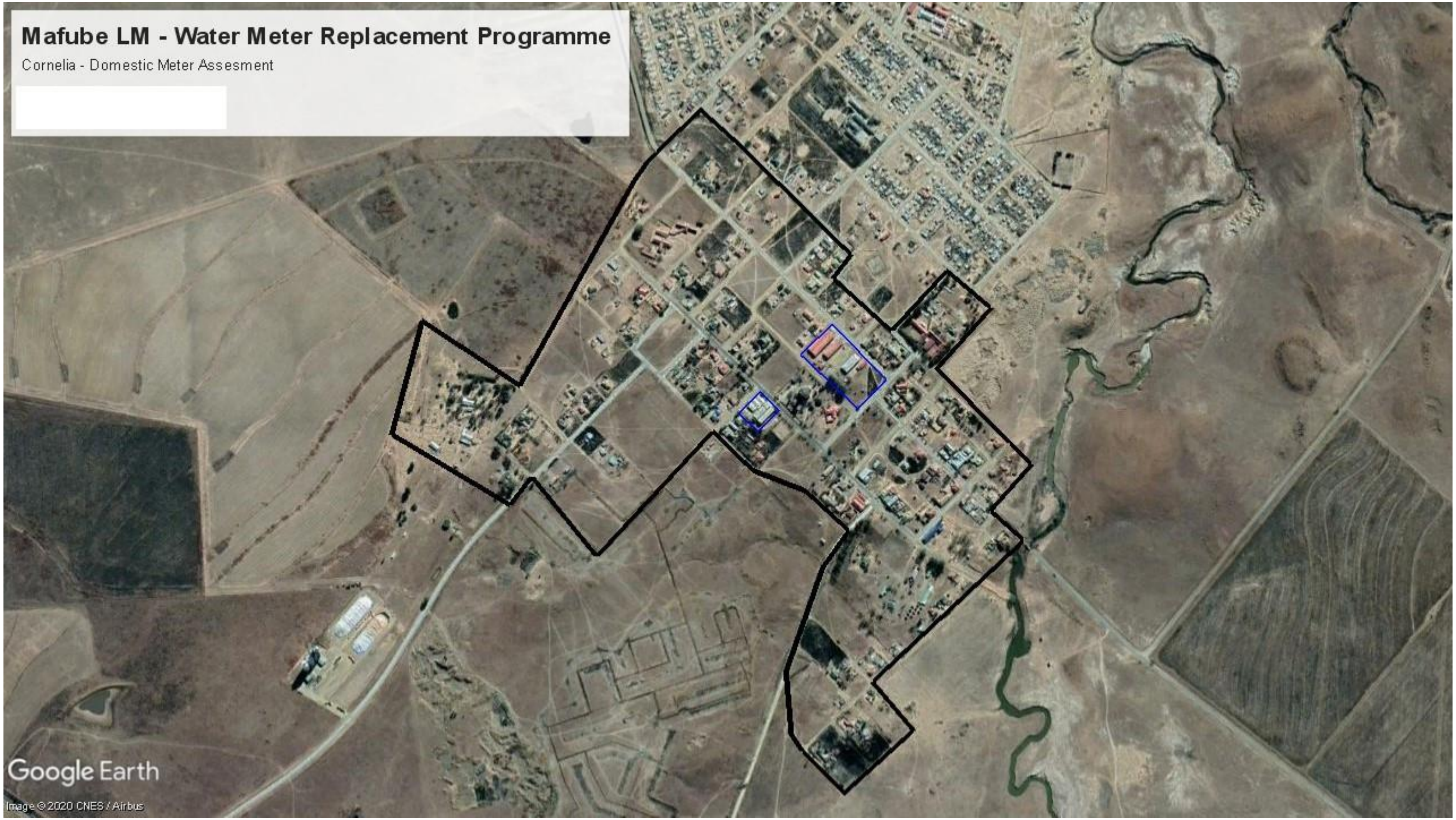
12.2 VILLIERS


Mafube LM - Water Meter Replacement Programme
Villiers - Domestic Meter Assesment
Google Earth
Image © 2020 Maxar Technologies

12.3 TWEELING


Mafube LM - Water Meter Replacement Programme
Tweeling - Domestic Meter Assesment
Tweeling
Google Earth
Image © 2020 CNES / Airbus

12.4 CORNELIA



Mafube LM - Water Meter Replacement Programme

Cornelia - Domestic Meter Assesment

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